



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/975,435	10/11/2001	Bijan Davari	YOR919990101 US2	9650

7590 07/01/2003
Robert M. Trepp, Attorney
IBM Corporation
Intellectual Property Law Dept.
P.O. Box 218
Yorktown Heights, NY 10598

EXAMINER

PHAM, LONG

ART UNIT PAPER NUMBER

2814

DATE MAILED: 07/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/975,435

Applicant(s)

DAVARI ET AL.

Examiner

Long Pham

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 35-56 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 51-56 is/are allowed.
- 6) ☒ Claim(s) 35-37, 40, 41, and 44-50 is/are rejected.
- 7) ☒ Claim(s) 38, 39, 42 and 43 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____ 6) ☐ Other: .

DETAILED ACTION

Rejections and/or objections as previously applied

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 35, 40, and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Tadashi Ikeda (JA '323A).

Ikeda teaches a method for forming spaced apart silicon-on-insulator (SOI) regions on a silicon containing substrate 1 comprising the steps (see the English abstract and all figures):

forming a first mask 5 having openings therein on said silicon containing substrate;

implanting oxygen ions 5a through said openings in said first mask into said substrate, wherein the mask blocks the oxygen ions from entering the a bulk region of the substrate, and

after removing the mask, annealing said substrate to form a plurality of first buried oxide regions 3 below a silicon containing layer whereby said spaced apart silicon-on-insulator are formed.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2814

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 36, 44, 45, 46, and 47-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tadashi Ikeda (JA '323A) as applied to claims 35, 40, and 41 above, and further in view of Yamazaki (US '846).

Ikeda fails to teach the range for the energy for the implantation of oxygen to obtain the claimed thickness for the buried oxide layers as recited in present claims 36 and 37.

However, it would have been obvious to one of ordinary skill in the art of making semiconductor devices to determine the workable or optimal range for the energy for the implantation of oxygen to obtain the claimed thickness for the buried oxide layers through routine experimentation and optimization to obtain optimal or desired device performance because the range for the energy for the implantation of oxygen to obtain the claimed thickness for the buried oxide layers is a result-effective variable and there is no evidence indicating that the range for the energy for the implantation of oxygen to obtain the claimed thickness for the buried oxide layers is critical or produces any unexpected results and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

Ikeda further fails to teach that the buried oxide layer is formed by tilted implantation as recited in present claim 44.

However, the use of tilted implantation for forming the buried oxide layer is well-known to one of ordinary skill in the art of making semiconductor devices.

Ikeda further fails to teach the range for the angle of the implantation of oxygen as recited in present claim 45.

However, it would have been obvious to one of ordinary skill in the art of making semiconductor devices to determine the workable or optimal range for the angle of the implantation of oxygen through routine experimentation and optimization to obtain optimal or desired device performance because for the range for the angle of the implantation of oxygen is a result-effective variable and there is no evidence indicating that the range for the angle of the implantation of oxygen is critical or produces any unexpected results and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

Ikeda further fails to teach that a field effect transistor is formed in the silicon containing layer as recited in present claim 46.

However, the formation of field effect transistors in a silicon containing layer is well-known to one of ordinary skill in the art of making semiconductor devices.

Ikeda further fails to teach steps of forming trench isolation as recited in present claims 47-50.

Yamazaki teaches a method of forming SOI in which trenches are formed through the SOI regions by removing the silicon substrate and end parts of the buried oxide layer 4' and the trenches are filled with insulator 12. See all figures and associated text.

It would have been obvious to one of ordinary skill in the art of making semiconductor devices to incorporate Yamazaki's above teachings into Ikeda's method because in doing so the defects at the boundary between the buried oxide layers and semiconductor substrate are prevented. See col. 3, lines 1-5.

Response to Arguments

5. Applicant's arguments filed 04/17/03 have been fully considered but they are not persuasive. See below.

In response to the applicants' arguments in the two middle paragraphs on pages 5, 7, and 8 of the "AMENDMENT AND RESPONSE" submitted 04/17/03, the applicants are directed to figures 4(a)-4(c) of Tadashi Ikeda (JA '323A).

Allowable Subject Matter

6. Claims 51-56 are allowed.

7. Claims 38, 39, 42, and 43 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Long Pham whose telephone number is 703-308-1092. The examiner can normally be reached on M-F, 8:30AM-5:00PM.

Art Unit: 2814

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 703-308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-4082 for regular communications and 703-746-4082 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



Long Pham
Primary Examiner
Art Unit 2814

L. P.

June 26, 2003